AT-WR2411 Wireless Ethernet Radio Installation Guide

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For Technical Support, visit the Allied Telesyn website at *www.alliedtelesyn.com*.
For assistance in troubleshooting and installation, call 1-800-428-4835.

PN 613-50228-00 Rev A

Statements

Notice

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Regulatory Information

USA – Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions:

- This device may not cause harmful interference;
- This device must accept any interference received, including interference that may cause undesired operation.

Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device and a low power transmitter, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is not a guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna;
- Increase the distance between the equipment and the receiver;
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected;

- Consult the dealer or an experienced radio/TV technician for help.

Canada – Industry Canada (IC)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of Industry Canada (RSS 210).

Le présent appareil numérique n'émet pas de bruits radio-électriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dens le Règlement sur le brouillage radioélectrique édicté par l'Industrie (RSS210).

To prevent radio interference to the licensed service, this device must be operated indoors only and should be kept away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

Europe – EU Declaration of Conformity

This device complies with the specifications listed below, following the provisions of the EMC Directive 89/336/EEC:

- ETS 300-826 General EMC requirements for Radio equipment
- ETS 300-328 Technical requirements for Radio equipment

CE Mark - Declaration of Conformance

This is to certify that this product complies with ISO/IEC Guide 22 and EN45014. It conforms to the following specifications:

- EMC: EN55022(1988)/CISPR-22(1985) Class B
- IEC 61000-4-2(2000) 4kVCD,
- 8kVAD
- IEC 61000-4-3(2000) 3V/m
- IEC 61000-4-4(2000) 1kV- (power line)
- IEC 61000-4-6(2000) 3Vrms
- IEC 61000-4-11(2000) 3Vrms

This product complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC, and carries the CE Mark accordingly.

Precautions

Safety

- Operation of any radio transmitting equipment, including a AT-WR2411 Wireless Ethernet PC Card, may cause interference with the functionality of inadequately protected medical devices.
- Do not use the AT-WR2411 Wireless Ethernet PC Card on an aircraft.
- Do not use the AT-WR2411 Wireless Ethernet PC Card at a refueling point.
- Do not use the AT-WR2411 Wireless Ethernet PC Card near flammable materials or chemicals.
- Do not use the AT-WR2411 Wireless Ethernet PC Card where blasting is in progress.
- Do not use the AT-WR2411 Wireless Ethernet PC Card when the use of wireless device may cause interference or danger.
- Do not use the AT-WR2411 Wireless Ethernet PC Card where the use of cellular terminals is prohibited.
- Only qualified service personnel must repair the equipment.
- Use approved accessories only. Do not connect incompatible products.
- Use only accessories approved by the AT-WR2411 Wireless Ethernet PC Card manufacturer for use with this particular AT-WR2411 Wireless Ethernet PC Card. The use of any other types will invalidate any approval or warranty applying to the AT-WR2411 Wireless Ethernet PC Card, and may be dangerous.
- Use only the channel settings appropriate for the country where the AT-WR2411 Wireless Ethernet PC Card is used at the present time. Using the card with incorrect channel settings is prohibited and may be illegal.
- Do not drop or cause a mechanical shock to the AT-WR2411 Wireless Ethernet PC Card, as this may damage the unit.

Installation

Do not place the AT-WR2411 Wireless Ethernet PC Card where it will be exposed to the following conditions:

- Unstable surface.
- High humidity or poor ventilation.
- Excessive dust.
- Direct sunlight or extreme heat.
- Closed cars.
- Magnetized location (near a magnets, speaker, or TV).

Operation

- If the AT-WR2411 Wireless Ethernet PC Card is moved directly from a cold location to a warm one, or if it is placed in a very damp environment, moisture may condense on the parts inside. The AT-WR2411 Wireless Ethernet PC Card may not operate properly should moisture occur.
- The AT-WR2411 Wireless Ethernet PC Card supports 3.3V notebook computers only.
- Microwave oven degrades the performance of wireless LAN drastically. So do not use the AT-WR2411 Wireless Ethernet PC Card in the environment where microwave oven is being used.

Cleaning

Clean the casing with a soft cloth, lightly moistened with water or a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzene as it may damage the finish of the casing.

Hardware Description

The AT-WR2411 Wireless Ethernet PC Card is an extended type II PC card (PCMCIA card). The AT-WR2411 Wireless Ethernet PC Card is for mobile, portable notebook computers, mobile data systems, and appliances. It is compatible with wireless inbuilding local area networks that are proliferating in general enterprise office computing, small office/ home office, residential consumer, and public space markets.

The AT-WR2411 Wireless Ethernet PC Card is designed to be interoperable with any wireless IEEE 802.11 and IEEE 802.11b LAN product that is based on Direct Sequence Spread Spectrum (DSSS) radio technology, and is compliant to the IEEE 802.11 Standard on Wireless LANs (Revision B), as defined and approved by the Institute of Electrical and Electronics Engineers.

LED Indicator

The AT-WR2411 Wireless Ethernet PC Card includes one status LED indicator, whose operation is described in the following table

Mode	Status	Description
Ad Hoc	Flashing Monitor is Steady Yellow	Indicates that the AT-WR2411 Wireless Ethernet PC Card is searching for an existing Ad Hoc network
	Steady (On) Monitor is Steady Green	Indicates that the AT-WR2411 Wireless Ethernet PC Card has joined an existing Ad Hoc network
Infrastructure	Flashing	Indicates that the AT-WR2411 Wireless Ethernet PC Card is browsing active access points.
	Steady (On)	Indicates a valid connection to an access point.

System Requirements

Prior to installing the AT-WR2411 Wireless Ethernet PC Card, please check your system for the following requirements:

- A computer with a PCMCIA Type II slot, and a PCMCIA card and socket services compliant with revision 2.10 of the PCMCIA specification.

- Windows 98/Millennium Edition/2000 (Please have the Windows installation CD-ROM available for use during installation).

- A minimum of 1M bytes of free disk space for installing the driver and utility programs.

Hardware Installation

This chapter describes how to install your AT-WR2411 Wireless Ethernet PC Card into the PC Card slot of your computer.

Preparation

Unpack your AT-WR2411 Wireless Ethernet PC Card kit and verify all items are present as described below. If any items appear to be damaged or missing, please contact your supplier.

Your AT-WR2411 Wireless Ethernet PC Card comes with the following items:

- AT-WR2411 Wireless Ethernet PC Card (1)
- CD-ROM (Set-up/driver disk, User Manual, and Customer License Agreement) (1)
- Quick Installation for Windows 98/Millennium Edition/2000 (1)
- Warranty Card (1)

Installing the PC Card into your notebook

1. Locate available Type II or Type III PCMCIA slot on your notebook computer. Remove the PC Card slot protector from the computer. (Some computers contain the card slot protector to prevent damage to the slot when not in use.)
2. With the PCMCIA adapter’s 68-pin connector facing the PCMCIA slot and the Allied Telesyn label facing up, slide the PC Card into the PCMCIA slot until it is firmly seated. If the card does not fit easily, do not force it. Take the card out and try reinserting. Note that the PCMCIA slot allows you to “hot swap” PC Cards any time, even when the power of your computer is on.

Hardware installation is complete.

Removal

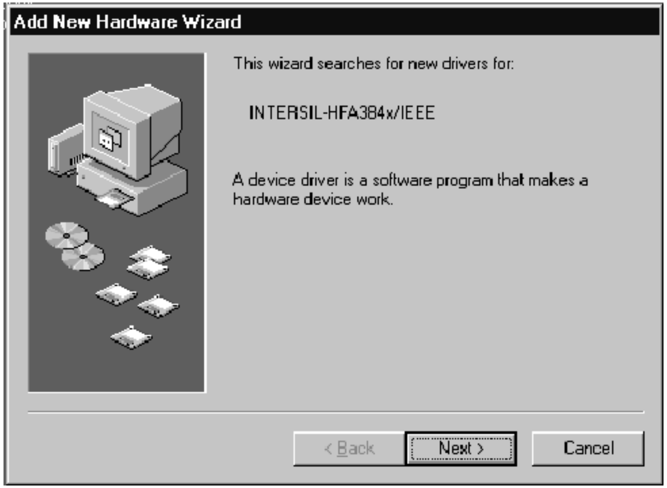
1. Close the software that uses the AT-WR2411 Wireless Ethernet PC Card.
2. Stop the PC Card Services on the system tray and Control Panel.
3. Remove the AT-WR2411 Wireless Ethernet PC Card, following the instructions in your computer’s manual.

Driver Installation for Windows

Introduction

This chapter describes the installation of the AT-WR2411 Wireless Ethernet PC Card Driver for the Microsoft Windows 95, 98, and 2000 operating systems. Note that Windows 98 screen pictures are used for illustrations.

Note: Prior to copying or installing the software, you are advised to read the Customer License Agreement. By installing, copying, or using the AT-WR2411 Wireless Ethernet PC Card software, you are consenting to be bound by this agreement. If you do not agree to all the terms of the Customer License Agreement, do not download, copy, or install the AT-WR2411 Wireless Ethernet PC Card software.



Add New Hardware Wizard

This wizard searches for new drivers for:

INTERSIL-HFA384x/IEEE

A device driver is a software program that makes a hardware device work.

What You Need to Know

Installing a AT-WR2411 Wireless Ethernet PC Card requires the same level of expertise that you would need to install any other type of standard Ethernet network adapter card. It is assumed that you have a working knowledge of standard Windows 98/Millennium Edition/2000 operations and of installing network adapter cards.

Installing the Driver Software

1. Insert the AT-WR2411 (with activity light facing up) into the computer's PC card slot. Once you insert the PC Card into your computer, Windows 98/Millennium Edition/2000 will automatically identify the PC Card and prompt you to install the necessary driver (when the operating system cannot find the required driver). This will typically occur when inserting the AT-WR2411 Wireless Ethernet PC Card into your computer for the first time.

2. Click "Next" to proceed.

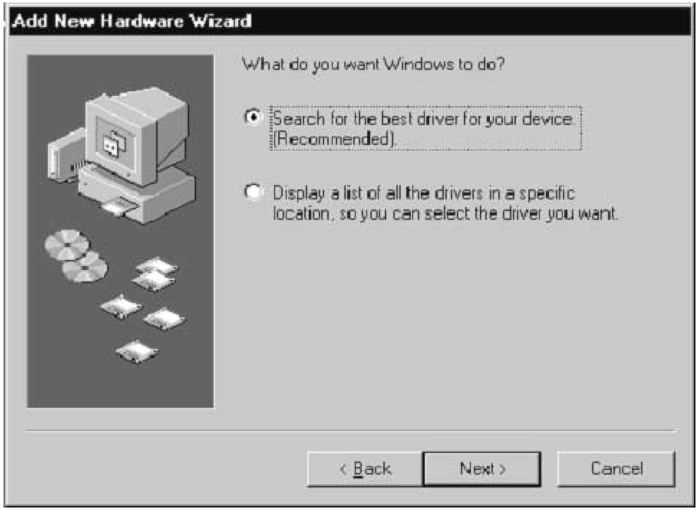
Note: In some occasions Windows 98/Millennium Edition/2000 operating systems may not detect the new hardware. This may be the case in situations where:

- The laptop computer into which you wish to install the AT-WR2411 Wireless Ethernet PC Card is a brand-new "out-of-the-box" computer, where the Windows 98/Millennium Edition/2000 operating system was already factory-installed.

- Previous installation of a AT-WR2411 Wireless Ethernet PC Card was aborted before it was finished.

On these occasions, it is necessary to manually install the hardware using the *Add New Hardware* control panel.

3. Make sure search for the best driver for your device is selected and click "Next".



Add New Hardware Wizard

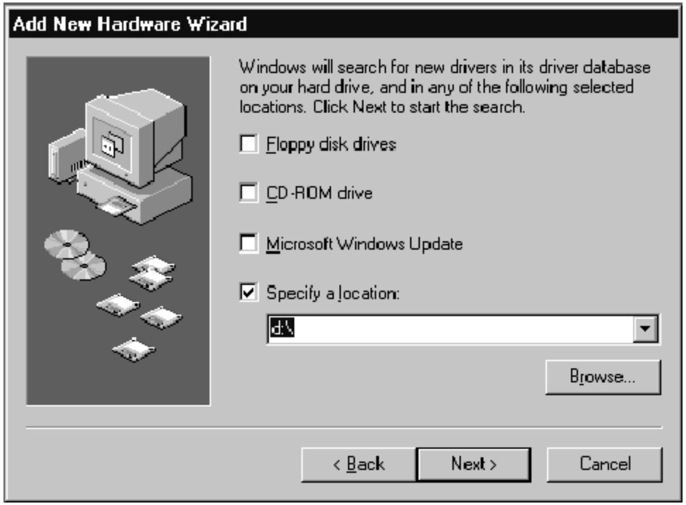
What do you want Windows to do?

● Search for the best driver for your device. (Recommended).

○ Display a list of all the drivers in a specific location, so you can select the driver you want.

4. Place Driver CD-ROM into your CD drive and close the drive.

5. Make sure that “Specify a location” is selected. Specify the correct drive letter for the CD drive and click “Next.”



Add New Hardware Wizard

Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.

☐ Floppy disk drives

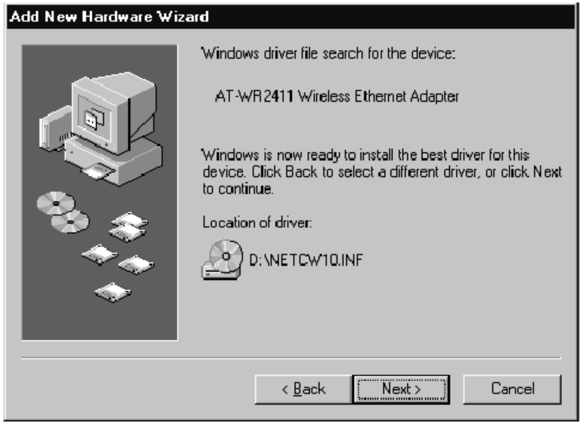
☐ CD-ROM drive

☐ Microsoft Windows Update

☑ Specify a location:

d:\

6. Verify that the correct folder is selected to install the driver and click “Next”.



Add New Hardware Wizard

Windows driver file search for the device:

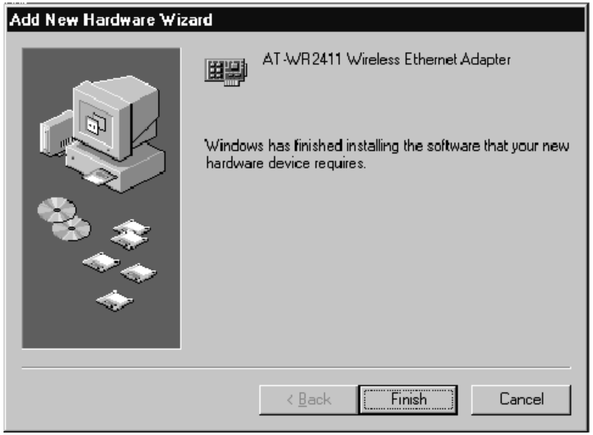
AT-WR2411 Wireless Ethernet Adapter

Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue.

Location of driver:

D:\NETCW10.INF

7. The driver files are being copied. Once this is completed, Windows will request that you insert the Windows 98/ Millennium Edition/2000 CD.



Add New Hardware Wizard

AT-WR2411 Wireless Ethernet Adapter

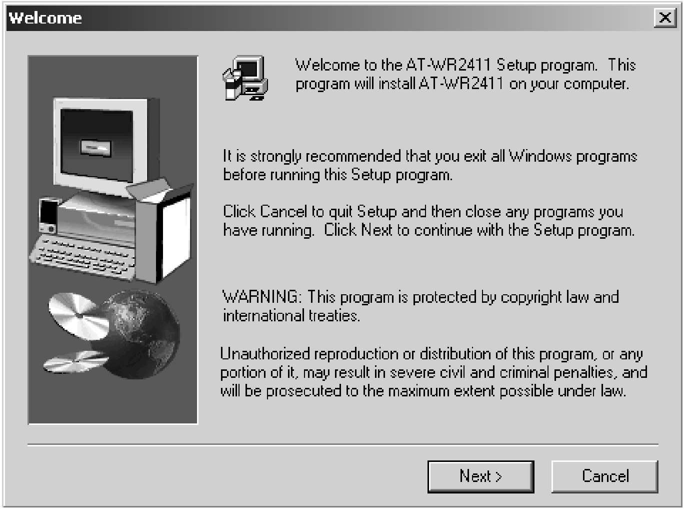
Windows has finished installing the software that your new hardware device requires.

8. Click “Finish”.

LAN Setup Program

1. Insert Allied Telesyn CDROM back into CDROM drive.

2. Select “Start”, then “Run”, then type “d:\setup.exe”, then select “Enter”.



Welcome

Welcome to the AT-WR2411 Setup program. This program will install AT-WR2411 on your computer.

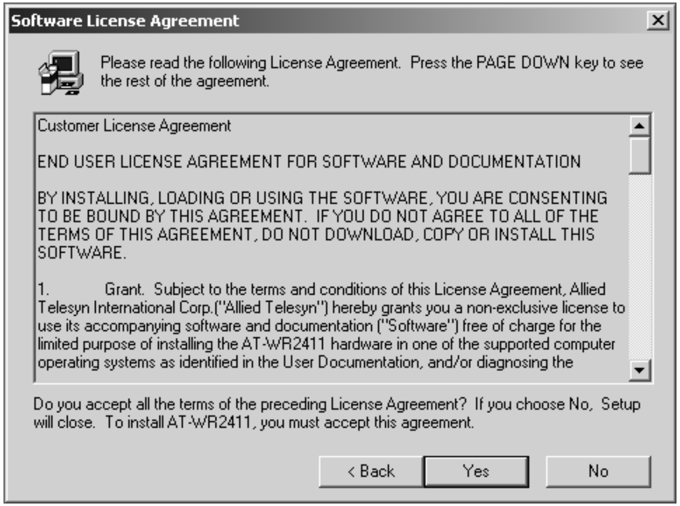
It is strongly recommended that you exit all Windows programs before running this Setup program.

Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.

WARNING: This program is protected by copyright law and international treaties.

Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

3. Click on “Next”.



Software License Agreement

Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.

Customer License Agreement

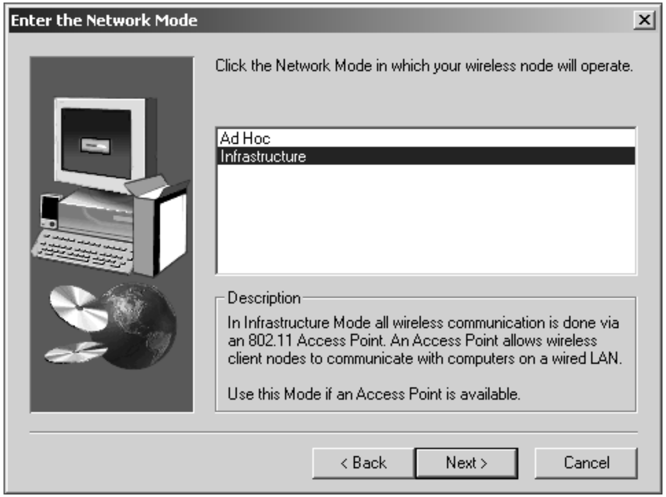
END USER LICENSE AGREEMENT FOR SOFTWARE AND DOCUMENTATION

BY INSTALLING, LOADING OR USING THE SOFTWARE, YOU ARE CONSENTING TO BE BOUND BY THIS AGREEMENT. IF YOU DO NOT AGREE TO ALL OF THE TERMS OF THIS AGREEMENT, DO NOT DOWNLOAD, COPY OR INSTALL THIS SOFTWARE.

1. Grant. Subject to the terms and conditions of this License Agreement, Allied Telesyn International Corp.("Allied Telesyn") hereby grants you a non-exclusive license to use its accompanying software and documentation ("Software") free of charge for the limited purpose of installing the AT-WR2411 hardware in one of the supported computer operating systems as identified in the User Documentation, and/or diagnosing the

Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install AT-WR2411, you must accept this agreement.

4. If acceptable, click on “Yes”.



Enter the Network Mode

Click the Network Mode in which your wireless node will operate.

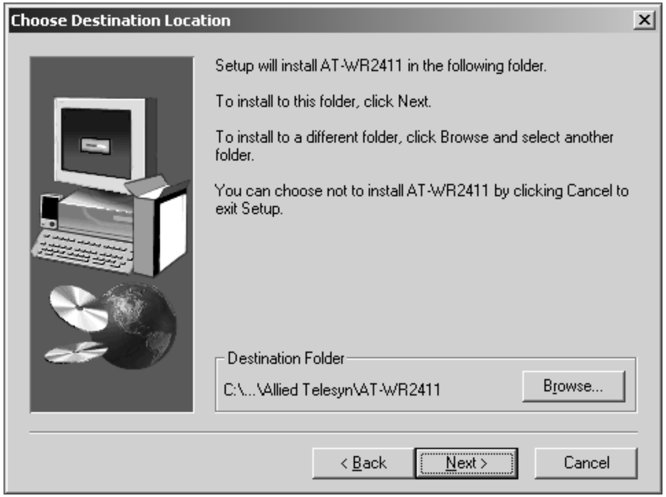
Ad Hoc
Infrastructure (selected)

Description

In Infrastructure Mode all wireless communication is done via an 802.11 Access Point. An Access Point allows wireless client nodes to communicate with computers on a wired LAN.

Use this Mode if an Access Point is available.

5. If you are to communicate to an access point/residential gateway, select “Infrastructure” and click “Next”. If not, select “Ad Hoc” and click “Next”.



Setup will install AT-WR2411 in the following folder.

To install to this folder, click Next.

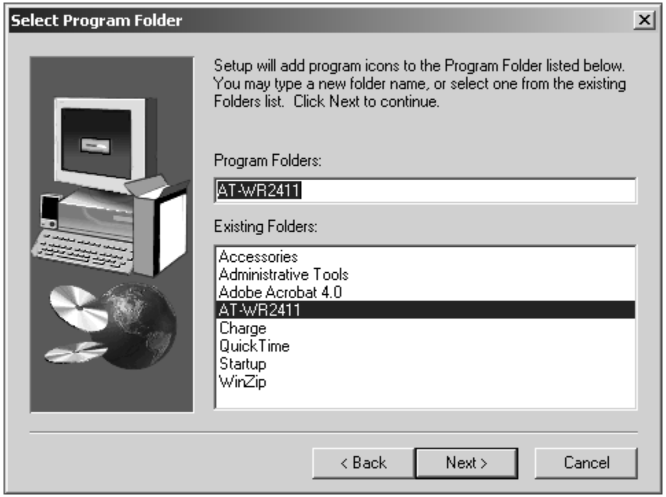
To install to a different folder, click Browse and select another folder.

You can choose not to install AT-WR2411 by clicking Cancel to exit Setup.

Destination Folder: C:\...\Allied Telesyn\AT-WR2411

Note: For more information on Ad Hoc and Infrastructure modes, see *“Wireless LAN Configurations”.*

6. Click on “Next”.



Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue.

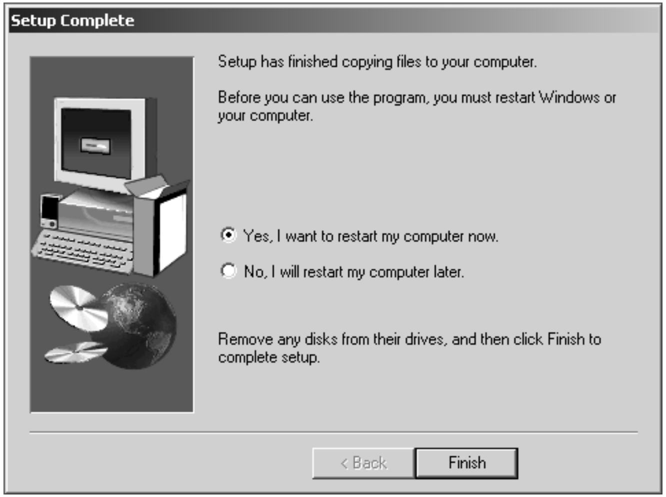
Program Folders: AT-WR2411

Existing Folders:

- Accessories
- Administrative Tools
- Adobe Acrobat 4.0
- AT-WR2411
- Charge
- QuickTime
- Startup
- WinZip

7. If Program Folder is acceptable, click “Next”. After Windows 98/Millennium Edition/2000 has copied files from your CD, you will be notified that installation has been completed.

8. Windows will ask you to restart your computer.



Setup Complete

Setup has finished copying files to your computer.

Before you can use the program, you must restart Windows or your computer.

● Yes, I want to restart my computer now.

○ No, I will restart my computer later.

Remove any disks from their drives, and then click Finish to complete setup.

9. Click the “Finish” button to restart.

Installation is complete.

Wireless LAN Configurations

End users access the 802.11 wireless LAN through wireless-LAN adapters, which are implemented as PC cards in notebooks, palmtop computers, or Internet appliances and as PCI cards in desktop computers. The nature of the wireless connection is transparent.

At its most basic, two PCs equipped with wireless adapter cards can set up an independent network whenever they are within range of one another. This is called a peer-to-peer or ad-hoc network. Peer-to-peer networks require no administration or pre configuration. Each client would only have access to the resources of the other client and not to a central server

Figure 1: A wireless peer-to-peer or Ad Hoc network without using the Access Point.

In a typical 802.11 wireless LAN configuration, a transmitter/receiver (transceiver) device, called an access point, connects to the wired network from a fixed location using standard cabling. At a minimum, the access point receives, buffers, and transmits data between the wireless LAN and the wired network infrastructure. A single access point can support a small group of users and can function within a range of less than 35 meters to several hundred meters.

Installing an access point can extend the range of a peer-to-peer network, effectively doubling the range at which the devices can communicate. Since the access point is connected to the wired network, each client can have access to server resources as well as to other clients. Each access point can accommodate many clients; the specific number depends on the number and nature of the transmissions involved. Many real-world applications exist where a single access point services up to 250 client devices.

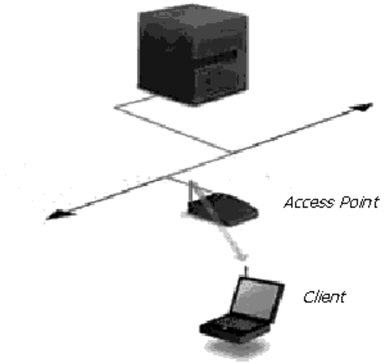


Figure 2: Client and Access Point

Access points have a finite range, on the order 35 meters indoor and 225 meters outdoors. In a very large facility such as a warehouse, or on a college campus, it may be necessary to install more than one access point.

A Residential Gateway provides the best utilization to multiple users by sharing a public IP address, in addition to providing connection to a DSL or cable modem. The embedded Network Address Translation (NAT) enables the use of private sets of IP addresses by translating to a single public IP address.

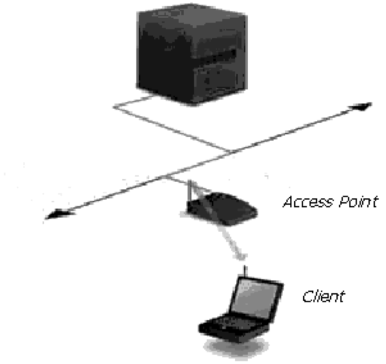


Figure 3: Client and Residential Gateway

Configuration and Diagnostic Utility

The AT-WR2411 Wireless Ethernet PC Card software provides management software for quick network configuration and easy diagnostics.

Using the Wireless LAN Utility

Once the installation is complete, the configuration utility can be accessed by selecting the “Configuration Utility” icon from the “802.11 Wireless LAN” folder.

Select “Start”, then “Programs”, then “AT-WR2411Wireless LAN, then “Configuration Utility”.

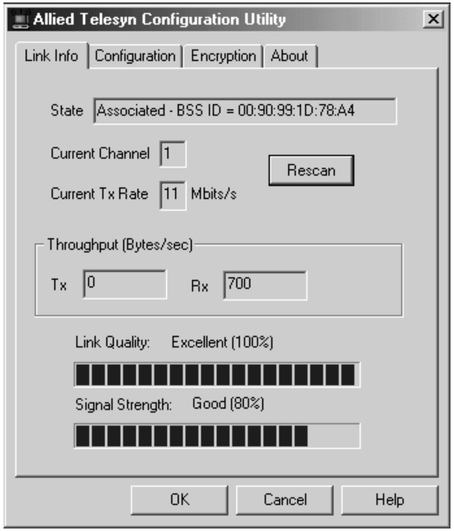
This configuration software includes the following functions:

Link Information. Allow you to monitor network status.

Configuration. Allows you to configure parameters for the AT-WR2411 Wireless Ethernet PC Card.

Encryption. Provides WEP security control.

Link Information Screen


Allied Telesyn Configuration Utility

State: Associated - BSS ID = 00:90:99:1D:78:A4

Current Channel: 1

Current Tx Rate: 11 Mbits/s

Throughput (Bytes/sec)

Tx: 0

Rx: 700

Link Quality: Excellent (100%)

Signal Strength: Good (80%)

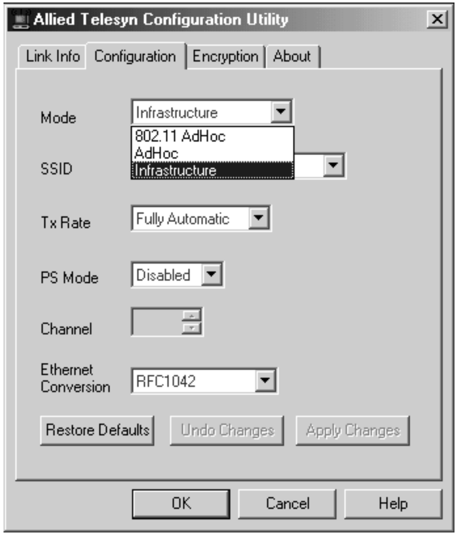
Figure 4: Link Information Tab

After starting the wireless LAN utility, the hardware information window is shown on the first folder of the utility windows as shown below. Click on Link Info tab to monitor the network status of the AT-WR2411 Wireless Ethernet PC Card, including the BSS ID, current channel, transmission rate used, throughput, link quality, and signal strength.

If you have completed all changes to the configuration, click on “Apply Changes” button, then click “OK”.

Configuration Screen

The Configuration Screen allows you to check and modify the configuration of the AT-WR2411 Wireless Ethernet PC Card. The user-definable parameters are shown below:


Allied Telesyn Configuration Utility

Mode: Infrastructure

802.11 AdHoc
AdHoc
Infrastructure

SSID

Tx Rate: Fully Automatic

PS Mode: Disabled

Channel

Ethernet Conversion: RFC1042

Figure 5: Configuration Tab

Mode

Set the station operation mode to:

AdHoc – network configuration that does not use access points

802.11 AdHoc is not a recommended mode.

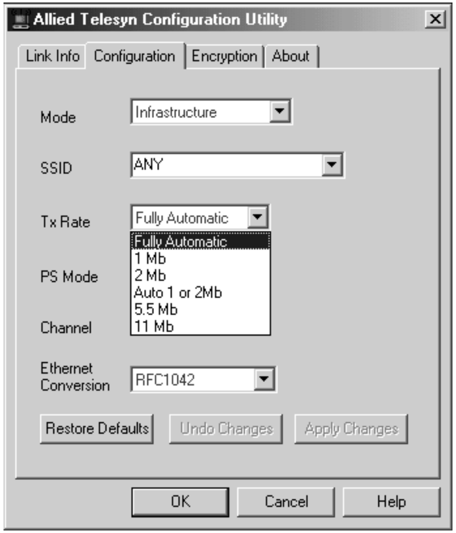
Default is "Infrastructure" – configurations with access points

SSID

The SSID identifies the access point (network). Input an SSID string that you want to connect to. In Infrastructure mode, SSID should be the same as the access point/residential gateway SSID. Default is "Any".

If you have completed all changes to the configuration, click on "Apply Changes" button, then click "OK"

TxRate



Mode: Infrastructure

SSID: ANY

Tx Rate: Fully Automatic

- Fully Automatic
- 1 Mb
- 2 Mb
- Auto 1 or 2Mb
- 5.5 Mb
- 11 Mb

Ethernet Conversion: RFC1042

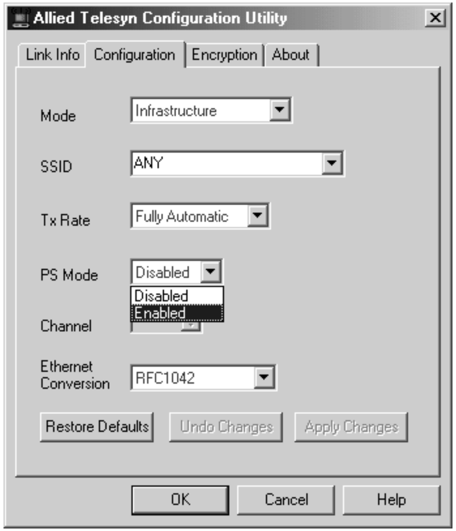
Figure 6: TxRate Selection

Indicates the transmission rates. Select appropriate transmission data rate to match your wireless LAN setting.

Default is "Fully Automatic".

If you have completed all changes to the configuration, click on "Apply Changes" button, then click "OK".

PS Mode



Mode: Infrastructure
SSID: ANY
Tx Rate: Fully Automatic
PS Mode: Disabled
Channel
Ethernet Conversion: RFC1042

Figure 7: PS Mode Selection

Enables the power saving mode to reduce power consumption. "Disabled" is default.

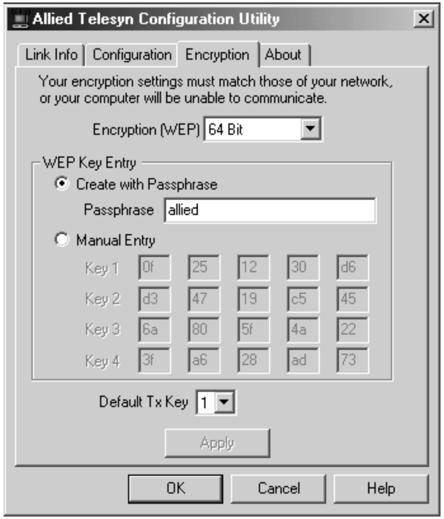
Channel

Ad-Hoc – set the channel number to the same channel as is being used by the other wireless clients in the group.

Infrastructure – the channel is automatically set to the access point that the AT-WR2411 Wireless Ethernet PC Card connects to.

If you have completed all changes to the configuration, click on "Apply Changes" button, then click "OK".

Encryption Screen



Your encryption settings must match those of your network, or your computer will be unable to communicate.

Encryption (WEP) 64 Bit

WEP Key Entry

● Create with Passphrase

Passphrase allied

○ Manual Entry

Key 1	0f	25	12	30	d6
Key 2	d3	47	19	c5	45
Key 3	6a	80	5f	4a	22
Key 4	3f	a6	28	ad	73

Default Tx Key 1

Figure 8: WEP Configuration Screen

WEP

For more secure data transmissions, select “64 bit” or “128 bit” setting to use WEP security. The 128-bit setting gives a higher level of security, but all devices in the network (i.e. access point, residential gateway) must have this same setting. For normal use, retain “Disabled” WEP, which is the default setting.

After you have completed all changes to the configuration, click on “Apply Changes” button, then click “OK”.

To use the WEP function, if you have selected “64 bit” or “128 bit” for the Encryption field in the Configuration folder, do the following:

1. Enter your “Passphrase” and click on “Apply” to create security keys.
2. Please record these key values for later use.

Note: The Passphrase function is an ASCII string that can be used to create hexadecimal-based WEP encryption keys. This is not a straight ASCII to hexadecimal conversion, but involves a special algorithm to automatically generate unique hexadecimal keys.

3. For 64 bit encryption or 128 bit encryption (64 bit encryption screen shown above), type in your encryption keys.
4. Select one encryption key as the default key (Key 1 to Key 4). It is desirable that default key selected is different in each client or station.

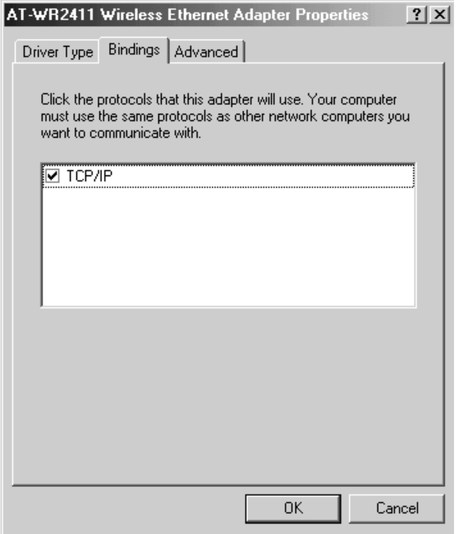
After completing all changes to “Encryption”, click “Apply, then “OK”.

It is recommended that you enter WEP keys in the AP using hexadecimal values. To enter the keys in an AT-WL2411, go to “IEEE 802.11b Radio” and then choose “WEP Configuration.” Enter the WEP encryption keys, preceded by the characters “0x” to indicate that you are entering the keys in hexadecimal (for example, 0x1234567890).

Adapter Card Properties

To view or change the 802.11 PC Card properties, select “Start”, “Settings”, “Control Panel”, then select “Network”.

1. Select TCP/IP, then click on “Properties”.



Click the protocols that this adapter will use. Your computer must use the same protocols as other network computers you want to communicate with.

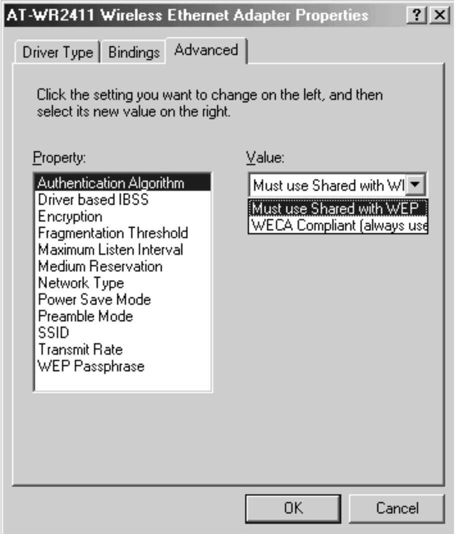
☑ TCP/IP

Figure 9: Properties Selection

2. Select “Advanced” tab.

Note: This is for use by an “Advanced” user only.

Authentication Algorithm



Click the setting you want to change on the left, and then select its new value on the right.

Property:
Authentication Algorithm
Driver based IBSS
Encryption
Fragmentation Threshold
Maximum Listen Interval
Medium Reservation
Network Type
Power Save Mode
Preamble Mode
SSID
Transmit Rate
WEP Passphrase

Value:
Must use Shared with WI
Must use Shared with WEP
WECA Compliant (always use

Figure 10: Authentication Algorithm

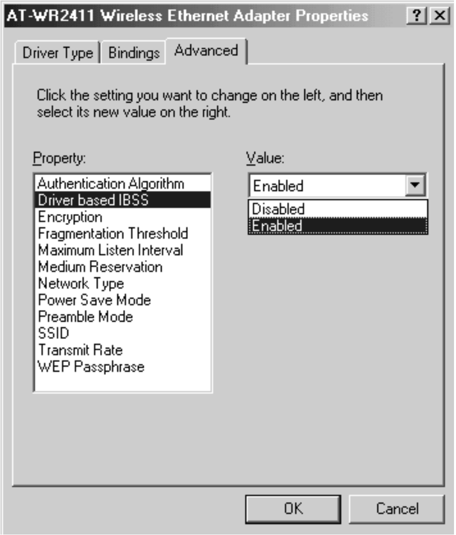
To communicate with the 802.11 AT-WR2411 Wireless Ethernet PC Card set the “Authentication Algorithm” to “WECA Compliant”. Use the same setting as other devices in your network.

Default is “WECA Compliant”.

Note: Setting the “Authentication Algorithm” to “Shared Key” may prevent the AT-WR2411 Wireless Ethernet PC Card from working with some access points and residential gateways.

If you have completed all changes to “Properties”, click “OK”.

Driver-based IBSS



Click the setting you want to change on the left, and then select its new value on the right.

Property:

- Authentication Algorithm
- Driver based IBSS
- Encryption
- Fragmentation Threshold
- Maximum Listen Interval
- Medium Reservation
- Network Type
- Power Save Mode
- Preamble Mode
- SSID
- Transmit Rate
- WEP Passphrase

Value: Enabled

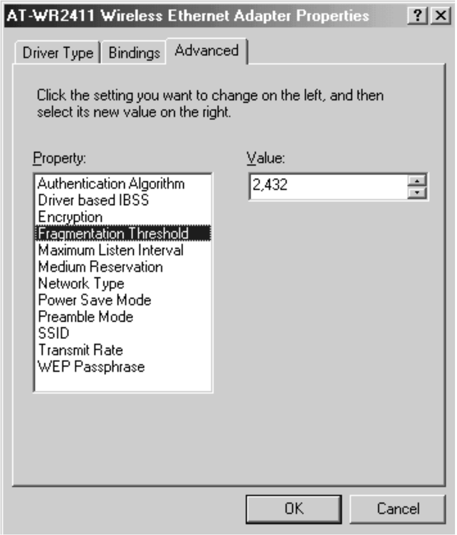
- Disabled
- Enabled

Figure 11: Driver-based IBSS

Default is “Enabled”.

If you have completed all changes to “Properties”, click “OK”.

Fragmentation Threshold



Click the setting you want to change on the left, and then select its new value on the right.

Property:

- Authentication Algorithm
- Driver based IBSS
- Encryption
- Fragmentation Threshold
- Maximum Listen Interval
- Medium Reservation
- Network Type
- Power Save Mode
- Preamble Mode
- SSID
- Transmit Rate
- WEP Passphrase

Value: 2,432

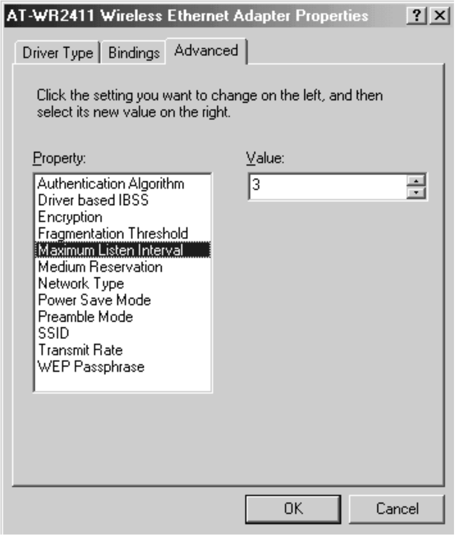
Figure 12: Fragmentation Threshold

The “Fragmentation Threshold” establishes the maximum size of the payloads in bytes.

Default is “2,432”.

If you have completed all changes to “Properties”, click “OK”.

Infrastructure STA – Listen Interval



Click the setting you want to change on the left, and then select its new value on the right.

Property:

- Authentication Algorithm
- Driver based IBSS
- Encryption
- Fragmentation Threshold
- Maximum Listen Interval
- Medium Reservation
- Network Type
- Power Save Mode
- Preamble Mode
- SSID
- Transmit Rate
- WEP Passphrase

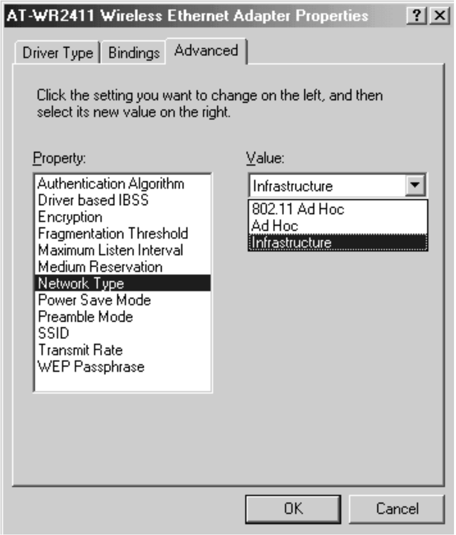
Value: 3

Figure 13: Maximum—Listen Interval

Default is “3”.

If you have completed all changes to “Properties”, click “OK”.

Network Type



Click the setting you want to change on the left, and then select its new value on the right.

Property:

- Authentication Algorithm
- Driver based IBSS
- Encryption
- Fragmentation Threshold
- Maximum Listen Interval
- Medium Reservation
- Network Type
- Power Save Mode
- Preamble Mode
- SSID
- Transmit Rate
- WEP Passphrase

Value: Infrastructure

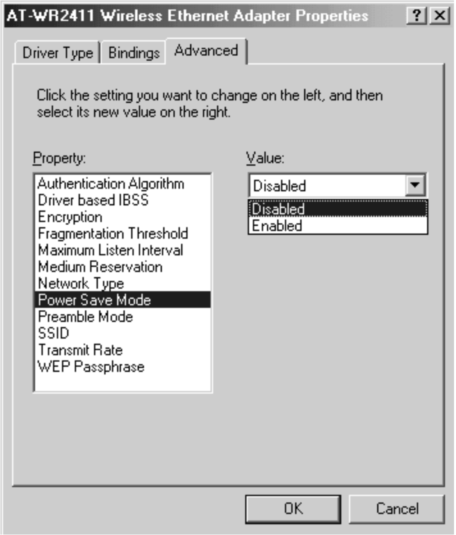
- 802.11 Ad Hoc
- Ad Hoc
- Infrastructure

Figure 14: Network Type

Set “Network Type” to “Ad Hoc” or “Infrastructure”. The “Infrastructure” mode allows a wireless adapter to communicate with a wired network employing an access point. The “Ad Hoc” mode allows wireless-to-wireless, point-to-point communication.

If you have completed all changes to “Properties”, click “OK”.

Power Save Mode



Click the setting you want to change on the left, and then select its new value on the right.

Property: Power Save Mode

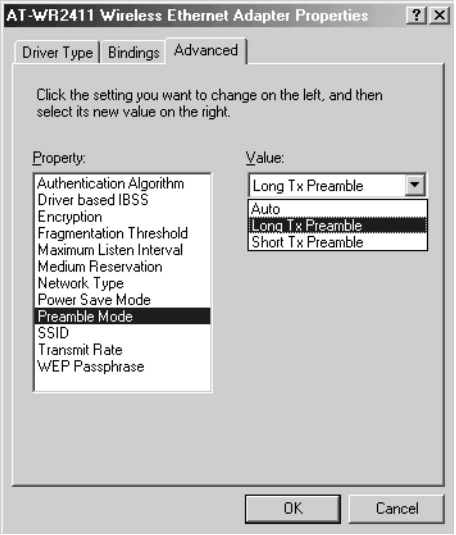
Value: Disabled

Figure 15: Power Save Mode

Select “Power Save Mode” and chose either “Enabled” or “Disabled”. “Disabled” will allow for uninterrupted data communication. Choosing “Enabled” allows your notebook to enter “sleep” mode and could interrupt communication.

After you have completed all changes to “Properties”, click “OK”.

Preamble Mode



Click the setting you want to change on the left, and then select its new value on the right.

Property: Preamble Mode

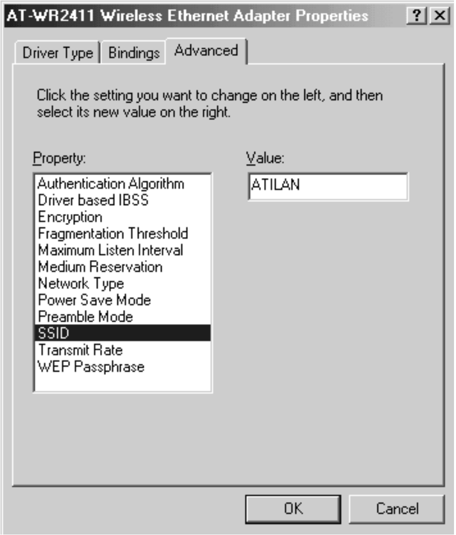
Value: Long Tx Preamble

Figure 16: Preamble Mode

Default is “Long Tx Preamble”.

After you have completed all changes to “Properties”, click “OK”.

SSID



AT-WR2411 Wireless Ethernet Adapter Properties

Click the setting you want to change on the left, and then select its new value on the right.

Property:

- Authentication Algorithm
- Driver based IBSS
- Encryption
- Fragmentation Threshold
- Maximum Listen Interval
- Medium Reservation
- Network Type
- Power Save Mode
- Preamble Mode
- SSID
- Transmit Rate
- WEP Passphrase

Value: ATILAN

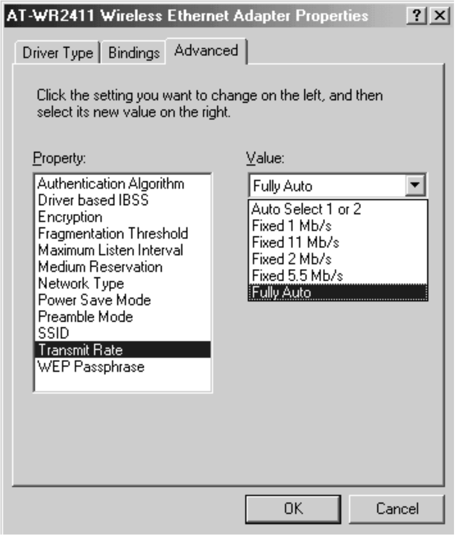
Figure 17: SSID Selection

The SSID identifies the access point (network). Input an SSID string that you want to connect to. In Infrastructure mode, SSID should be the same as the access point/residential gateway SSID.

Default is “Any”.

After you have completed all changes to “Properties”, click “OK”.

Transmit Rate



AT-WR2411 Wireless Ethernet Adapter Properties

Click the setting you want to change on the left, and then select its new value on the right.

Property:

- Authentication Algorithm
- Driver based IBSS
- Encryption
- Fragmentation Threshold
- Maximum Listen Interval
- Medium Reservation
- Network Type
- Power Save Mode
- Preamble Mode
- SSID
- Transmit Rate
- WEP Passphrase

Value: Fully Auto

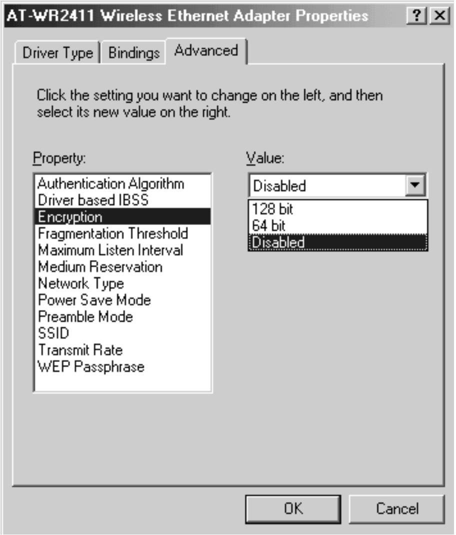
- Auto Select 1 or 2
- Fixed 1 Mb/s
- Fixed 11 Mb/s
- Fixed 2 Mb/s
- Fixed 5.5 Mb/s
- Fully Auto

Figure 18: Transmit Rate

Default is “Fully Auto”.

After you have completed all changes to “Properties”, click “OK”.

Use WEP



AT-WR2411 Wireless Ethernet Adapter Properties

Click the setting you want to change on the left, and then select its new value on the right.

Property: Encryption

Value: Disabled

Figure 19: Encryption Selection

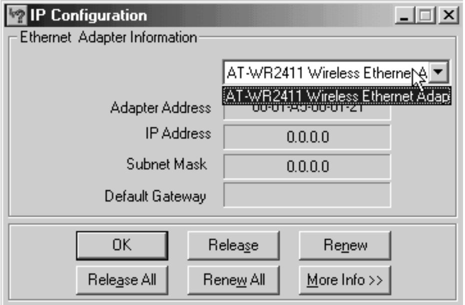
For more secure data transmissions, select “64 bit” or “128 bit” setting to use WEP security. The 128-bit setting gives a higher level of security than 64-bit. All devices in the network must have this same setting. For normal use, retain “Disabled” WEP.

After you have completed all changes to “Properties”, click “OK”.

IP Configuration

Only use if there is a DHCP server on the network to release/renew IP configuration. Select by clicking on “Winipcfg”.

Figure 20: Winipcfg Icon



IP Configuration

Ethernet Adapter Information

AT-WR2411 Wireless Ethernet Adap

IP Address: 0.0.0.0

Subnet Mask: 0.0.0.0

Default Gateway:

Figure 21: IP configuration Dialog Box

If you have selected an “Adapter”, click on “Release” or if you have not selected an “Adapter”, click on “Release All”, if you have done the following:

1. Moved your station from one access point/residential gateway to another
2. Replaced the AT-WR2411 Wireless Ethernet PC Card

3. Change mode from AD Hoc to Infrastructure.

Then click on “Renew” or “Renew All” as appropriate.

After you have completed all changes to “IP Configuration”, click “OK”.

Specifications

Automatic Rate Selection11, 5.5, 2, or 1 Mbps

Standards Compatible to IEEE 802.11b 11 Mbps and 5.5 Mbps standard and IEEE 802.11 Direct Sequence Spread Spectrum (DSSS) 1 Mbps and 2 Mbps standard

Operating Range1

Open Environment2750 ft. (225 m) @ 11 Mbps

1250 ft. (380 m) @ 5.5 Mbps

1800 ft. (550 m) @ 2 Mbps

2500 ft. (775 m) @ 1 Mbps

Semi Open Environment3225 ft. (70 m) @ 11 Mbps

325 ft. (100 m) @ 5.5 Mbps

420 ft. (125 m) @ 2 Mbps

530 ft. (160 m) @ 1 Mbps

Closed Environment4115 ft. (35 m) @ 11 Mbps

160 ft. (50 m) @ 5.5 Mbps

180 ft. (55 m) @ 2 Mbps

225 ft. (70 m) @ 1 Mbps

Transmitted Output Power+20 dBm EIRP

(Typical)

Receiver Sensitivity-82 dBm @ 11 Mbps

(Typical) -87 dBm @ 5.5 Mbps

-91 dBm @ 2 Mbps

-94 dBm @ 1 Mbps

Frequency Band 2,400 MHz. to 2,483.5 MHz

Modulation DBPSK; DQPSK

Coding Technique1 Mbps and 2 Mbps: 11 chip/bit Barker Coding

5.5 Mbps and 11 Mbps: Complementary CodeKeying (CCK)

Number of ChannelsUSA/Canada (FCC/RSS)11

Japan (JP) 1

France (FR) 4

Remainder of Europe (ETS)13

Security Secure information transmission with 40 and 128-bit Wired Equivalent Privacy (WEP) Data Encryption, RC4

Antenna Integrated dual diversity antenna system

Operating voltage3.3 V ± 5%

Environmental Operating 32× to 95× F. (0× to 35× C.)

95% humidity max, non condensing

Storage -13× to 140× F. (-20× C. to 70× C.)

95% humidity max, non condensing

Host Interface PC Card Type II

Dimensions	117.8 mm x 53.95 mm x 8.7 mm (PC Card)
Electromagnetic ComplianceUSA	FCC (47CFR) Part 15C, Section 15.247
Canada	ISC RSS-210
Europe:	ETS 300 328 and ETS 300 826

Actual data transmissions rates may vary considerably depending on the number of users, type of usage (file sizes and frequency of up/down loading), speed of network, typical packet size, and distance from an access point or other mobile user. Walls, partitions, ceilings, racks, and merchandise, and the composition of the building's construction affect operating range in building.

- In Open Office environments, antennas can “see” each other, i.e. there are no physical obstructions between them.
- In Semi-open Office environments, workspace is divided by shoulder-height, hollow wall elements; antennas are at desktop level.
- In Closed Office environment, workspace is separated by floor-to-ceiling masonry walls or equivalent.

Radio Characteristics

Wireless communication is often subject to local radio regulations. Although AT-WR2411 Wireless Ethernet PC Card has been designed for operation in the license-free 2.4 GHz band, local radio regulations may impose a number of limitations to the use of wireless communication equipment. To comply with such regulations, please select the channel-sets identified for your country or region in Supported Channels below.

Supported Channels

Subject to the radio regulations that apply in your country, your AT-WR2411 Wireless Ethernet PC Card may support a different set of channels. Contact your authorized AT-WR2411 Wireless Ethernet PC Card reseller or Allied Telesyn main office for information about the radio regulations that apply in your country.

IEEE 802.11 Channels

Frequency Range	2400 MHz to 2485 MHz				
Channel ID	FCC	ETSI	Spain	France	Japan
1	2412	2412			
2	2417	2417			
3	2422	2422			
4	2427	2427			
5	2432	2432			
6	2437	2437			
7	2442	2442			
8	2447	2447			
9	2452	2452			
10	2457	2457	2457	2457	
11	2462	2462	2462	2462	
12		2467		2467	
13		2472		2472	
14					2484

Frequently Asked Questions

What are the benefits of wireless networking?

Wireless networking provides mobility, short and long-term cost savings, increased reliability, reduced installation times and easy installation in difficult areas.

Does wireless LAN eliminate the wired LAN?

No. Through the deployment of access points or base stations, wireless LAN technology can be used to extend the reach of an existing wired LAN.

What is the data rate for the Allied Telesyn AT-WR2411 Wireless Ethernet PC Card?

Automatic data rate selection dynamically supports 11, 5.5, 2, and 1 Mbps for maximum availability and reliability of network connections. The proper data rate is determined automatically permitting robust connectivity. The Allied Telesyn AT-WR2411 Wireless Ethernet PC Card automatically steps down from 11 Mbps to 5.5 Mbps to 2 Mbps to 1 Mbps as a user moves away.

What is the coverage area of the Allied Telesyn AT-WR2411 Wireless Ethernet?

Walls, partitions, ceilings, racks, and merchandise, and the composition of the building's construction affect operating range in building. Data transmission speed is also a factor that affects operating range. Lower data transmission speed allows greater distance due to improved receiver sensitivity (A measurement of the weakest signal a receiver can receive and still correctly translate it into data.). Transmitted output power is another factor that effects operating range. As the transmitted output power increases, the operating range increases.

In Open Office environments where antennas can "see" each other (there are no physical obstructions between them) typical operating ranges are:

- 750 ft. (225 m) @ 11 Mbps

In Semi-open Office environments where the workspace is divided by shoulder-height, hollow wall elements and antennas are at desktop level, typical operating ranges are:

- 225 ft. (70 m) @ 11 Mbps
- 325 ft. (100 m) @ 5.5 Mbps
- 420 ft. (125 m) @ 2 Mbps
- 530 ft. (160 m) @ 1 Mbps

In Closed Office environment where the workspace is separated by floor-to-ceiling masonry walls or equivalent, typical operating ranges are:

- 115 ft. (35 m) @ 11 Mbps
- 160 ft. (50 m) @ 5.5 Mbps
- 180 ft. (55 m) @ 2 Mbps
- 225 ft. (70 m) @ 1 Mbps

What is IEEE 802.11 standard?

The IEEE 802.11 Wireless LAN standards subcommittee, which is formulating a standard for the industry. The objective is to enable wireless LAN hardware from different manufacturers to communicate.

What IEEE 802.11 features are supported?

The Allied Telesyn AT-WR2411 Wireless Ethernet supports the following IEEE 802.11 functions:

- CSMA/CA plus Acknowledge protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS feature
- Fragmentation
- Power Management

What is the Ad-hoc mode?

In Ad-hoc (peer-to-peer) mode, several wireless stations (e.g. notebook computers) can get together in a local area (e.g. conference room) and form their own wireless network. Through peer-to-peer communication, they can share documents and devices. This allows peer-to-peer communication without using an access point

What is Infrastructure?

An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

What is Roaming?

Roaming is the ability for a wireless user to move from room to room, or even building to building on a campus, and not loose their connection to the network. Roaming is specifically defined as the ability to effortlessly move between access points that are on different channels but have the same network name.

Before using the roaming function, the workstation must make sure that it is the same channel number with the Access Point of dedicated coverage area. To achieve true seamless connectivity, the wireless LAN must incorporate a number of different functions. Each node and Access Point, for example, must always acknowledge receipt of each message. Each node must maintain contact with the wireless network even when not actually transmitting data. Achieving these functions simultaneously requires a dynamic RF networking technology that links Access Points and nodes. In such a system, the user's end node undertakes a search for the best possible access to the system. First, it evaluates such factors as signal strength and quality, as well as the message load currently being carried by each Access Point and the distance of each Access Point to the wired backbone. Based on that information, the node next selects the right Access Point and registers its address. Communications between end node and host computer can then be transmitted up and down the backbone. As the user moves on, the end nodes RF transmitter regularly checks the system to determine whether it is in touch with the original Access Point or whether it should seek a new one. When a node no longer receives acknowledgment from its original Access Point, it undertakes a new search. Upon finding a new Access Point, it then reregisters, and the communication process continues.

What is BSS ID?

The Basic Service Set (BSS) is the communication domain for each access point. Computers in a BSS must be configured with the same BSS ID.

What is ESS ID?

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could Roam freely between BSSs while served as a continuous connection to the network wireless stations and Access Points within an ESS must be configured with the same ESS ID and the same radio channel.

What is ISM band?

The FCC and their counterparts outside of the U.S.A. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is available worldwide.

What is Spread Spectrum?

Spread Spectrum technology is a wideband radio frequency technique developed by the military for use in reliable, secure, mission-critical communications systems. It is designed to trade off bandwidth efficiency for reliability, integrity, and security. In other words, more bandwidth is consumed than in the case of narrowband transmission, but the trade off produces a signal that is, in effect, louder and thus easier to detect, provided that the receiver knows the parameters of the spread-spectrum signal being broadcast. Direct-sequence spread-spectrum (DSSS) generates a redundant bit pattern for each bit to be transmitted. This bit pattern is called a chip (or chipping code). The longer the chip, the greater the probability that the original data can be recovered. Even if one or more bits in the chip are damaged during transmission, statistical techniques embedded in the radio can recover the original data without -the need for retransmission. To an unintended receiver, DSSS appears as low power wideband noise and is rejected (ignored) by most narrowband receivers.

Would the information be intercepted while transmitting on air?

Wireless LAN features two-fold protection in security. On the hardware side, with Direct Sequence Spread Spectrum technology, it has the inherent security feature of scrambling. On the software side, wireless LAN series offer the encryption function (WEP) to enhance security and Access Control.

What is WEP?

WEP is Wired Equivalent Protection, a data privacy mechanism (RC4 encryption algorithm) based on four 10-bit keys for the 64-bit WEP setting or one 26-bit key for the 128-bit WEP setting, as described in the IEEE 802.11 standard. This WEP security protects your wireless LAN against eavesdropping and unauthorized access by hackers or unexpected intruders.

Troubleshooting

If you encounter difficulty using and/or installing your AT-WR2411 Wireless Ethernet PC Card, the error may be related to various causes:

- Out-of range situation, which prevents the AT-WR2411 Wireless Ethernet PC Card from establishing a wireless connection with the network.
- Configuration mismatch, which prevents the AT-WR2411 Wireless Ethernet PC Card from establishing a wireless connection with the (correct) network.
- Absence of, or conflict of the AT-WR2411 Wireless Ethernet PC Card Driver.
- A problem or conflict with the PC Card slot which prevents the PC Card from powering on.
- A conflict of the AT-WR2411 Wireless Ethernet PC Card hardware with another device.

This section describes how to solve common problems you may encounter when using your AT-WR2411 Wireless Ethernet PC Card. Many problems have simple solutions.

My computer does not detect the AT-WR2411 Wireless Ethernet PC Card.

- The AT-WR2411 Wireless Ethernet PC Card may not be properly inserted into the PC card slot of your computer. Check that the AT-WR2411 Wireless Ethernet PC Card is inserted in the proper direction, then push it in as far as it will go.

Other computers on the wireless LAN are not displayed.

- You did not enter the password when Windows started. Enter the user name and the password requested on Windows startup, then log onto the LAN.
- The windows environment is not properly set up. Follow the instructions in Setting up Windows environment to set it up properly.
- No other computers are logged onto the wireless LAN.

The data transfer speed is slow.

- There is radio interference with another Access Point. Try assigning another channel number using one of the Access Point setup utilities.
- There are too many clients logging on to the Access Point. Try later.

The communication data rate is supposed to be 11 Mbps, but MPEG2 data transfer fails.

- 11 Mbps is the gross transmission rate. The actual net transmission rate is approximately 4 to 5 Mbps. This occurs with almost all IEEE 802.11 compliant products. The high-speed stream transfer of MPEG2 using very short packets, may require a higher gross transmission rate.

No communication is available even though my computer is located within 50 m (165 feet) of the Access Point.

- The actual communication distance depends on the installation site and ambient conditions. Move your computer closer to the Access Point.

Glossary

Access Point (AP): Any entity that has station functionality and provides access to the distribution services, via the wireless medium (WM) for associated stations.

Ad Hoc Network: A network composed solely of stations within mutual communication range of each other via the wireless medium (WM). An ad hoc network is typically created in a spontaneous manner. The principal distinguishing characteristic of an ad hoc network is its limited temporal and spatial extent. These limitations allow the act of creating and dissolving the ad hoc network to be sufficiently straightforward and convenient so as to be achievable by nontechnical users of the network facilities; i.e., no specialized “technical skills” are required and little or no investment of time or additional resources is required beyond the stations that are to participate in the ad hoc network. The term ad hoc is often used as slang to refer to an independent basic service set (IBSS).

Channel: An instance of medium use for the purpose of passing protocol data units (PDUs) that may be used simultaneously, in the same volume of space, with other instances of medium use (on other channels) by other instances of the same physical layer (PHY), with an acceptably low frame error ratio due to mutual interference. Some PHYs provide only one channel, whereas others provide multiple channels.

Channel number: The frequency used for wireless communications. Wireless communications are available only among client computers and Access Points that use the same channel.

Client: A single computer on a wireless LAN. It may be called a client computer.

DHCP (Dynamic Host Configuration Protocol): DHCP lets network administrators centrally manage and automate assignment of IP addresses with a network environment.

DNS (Domain Name System): A system that translates host names into IP addresses. Networks that use the TCP/IP protocol, such as the Internet, use a set of numbers like 192.168.0.1 (IP address) to identify a computer. However, since the IP address is rather hard to remember, DNS was developed to allow a name like "www.alliedtelesyn.com" to identify a computer for convenience. DNS servers manage these translations from host names into IP addresses.

Distribution System (DS): A system used to interconnect a set of basic service sets (BSSs) and integrated local area networks (LANs) to create an extended service set (ESS).

Encryption Key: IEEE802.11-compliant security system. Using the Encryption Key as the password, only client computers and Access Points that have the same ID and password may log onto the same wireless LAN for file sharing.

Extended Service Set (ESS): A set of one or more interconnected basic service sets (BSSs) and integrated local area networks (LANs) that appears as a single BSS to the logical link control layer at any station associated with one of those BSSs.

Independent Basic Service Set (IBSS): A BSS that forms a self-contained network, and in which no access to a distribution system (DS) is available.

LAN (Local Area Network): A network, which is accessible only to its members, unlike the Internet, which is open to an unlimited number of people. A LAN may be built for different purposes. For example, you can build an office LAN that is accessible only to members of the same department or a home LAN that is accessible only to family members.

Protocol: The formal specifications that define the procedures for computers to follow when transmitting and receiving data.

TCP/IP (Transmission Control Protocol/Internet Protocol): TCP is a connection-oriented protocol for establishing reliable, sequenced data transfer. TCP ensures that data reaches its destination. IP assembles and addresses data packets for transmission to their network destinations.

WAN (Wide Area Network): A network that interconnects remote LANs through the Internet or telephone lines.

Wired Equivalent Privacy (WEP): The optional cryptographic confidentiality algorithm specified by IEEE 802.11 used to provide data confidentiality that is subjectively equivalent to the confidentiality of a wired local area network (LAN) medium that does not employ cryptographic techniques to enhance privacy.

Abbreviations and Acronyms

ACK	acknowledgment
AP	access point
BSA	basic service area
BSS	basic service set
BSSID	basic service set identification
CTS	clear to send
DBPSK	differential binary phase shift keying
DCE	data communication equipment
DLL	data link layer
DQPSK	differential quadrature phase shift keying
DS	distribution system
DSS	distribution system service
DSSS	direct sequence spread spectrum
EIRP	equivalent isotropically radiated power
ESS	extended service set
FH	frequency hopping
FHSS	frequency-hopping spread spectrum
IBSS	independent basic service set
IP	Internet protocol
ISM	industrial, scientific, and medical
LAN	local area network
MAC	medium access control
PDU	protocol data unit
PHY	physical (layer)
PN	pseudo-noise (code sequence)
ppm	parts per million
PRNG	pseudo-random number generator
PS	power save (mode)
RF	radio frequency
RTS	request to send
RX	receive or receiver
SSID	service set identifier
STA	station
TX	transmit or transmitter
WAN	wide area network
WDM	wireless distribution media
WEP	wired equivalent privacy
WM	wireless medium

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